

WHAT IS CLAIMED IS:

1. A component mounting apparatus comprising:

a supplying unit (2) configured to supply a component;

5 a head (6) configured to have at least two nozzle rows aligned in a Y direction orthogonal to an X direction, each of which comprises at least one nozzle arranged in the X direction and configured to take out the component supplied from the supplying unit and to convey the component;

10 a circuit board holding unit (4) configured to hold a circuit board on which the component conveyed by the head is mounted; and

an inspection unit (7), which is disposed on a moving path of the head from the supplying unit to the circuit
15 board holding unit, configured to inspect a hold posture of the component held by the nozzle,

the inspection unit comprising: sensors (13, 14) for posture inspection arranged independently for respective nozzle rows of the nozzles arranged on the head; a lighting
20 unit (15, 16) configured to irradiate light beam to the head at a time of posture inspection; and an entrance port (17, 18) of optical information configured to take an image of the component held by the nozzle.

2. The component mounting apparatus as claimed in
25 claim 1, wherein the inspection unit is configured to have

the entrance port and the lighting unit arranged independently for each the sensor.

3. The component mounting apparatus as claimed in claim 2, wherein centers of fields of view of the
5 respective sensors of the inspection unit are aligned in the X direction without displacement.

4. The component mounting apparatus as claimed in claim 2, wherein centers of fields of view of the
10 respective sensors of the inspection unit are arranged to be shifted in the X direction.

5. The component mounting apparatus as claimed in claim 4, wherein in a case that the nozzles provided on the head are arranged in three rows or more in the Y direction, centers of fields of view of the respective sensors of the
15 inspection unit are arranged to be shifted in zigzag in the X direction.

6. The component mounting apparatus as claimed in claim 1, wherein the inspection unit is configured to have a common entrance port and a common lighting unit with
20 respect to all sensors of the inspection unit.

7. The component mounting apparatus as claimed in claim 6, wherein centers of fields of view of the respective sensors are arranged to be shifted in the X direction.

25 8. The component mounting apparatus as claimed in

claim 1, wherein the inspection unit is configured to have a reflectance including a mirror between the entrance port and the sensors, and the sensors are arranged on a side face of the inspection unit.

5 9. The component mounting apparatus as claimed in claim 1, wherein the inspection unit is configured to have a reflecting/transmitting member comprising a half mirror or a prism between the entrance port and the sensors, and the sensors of the inspection unit are disposed alternately
10 on a reflected light side and a transmitted light side of the reflecting/transmitting member with respect to optical information, of the component sucked by the nozzle, come through the entrance port.

15 10. The component mounting apparatus as claimed in claim 9, wherein lenses are provided between the reflecting/transmitting member and the sensors of the inspection unit.

20 11. The component mounting apparatus as claimed in claim 1, wherein a reflecting/transmitting member including a half mirror or a prism is provided between the entrance port and the sensors, and another sensor is additionally disposed at any position corresponding to a transmitted light side of the reflecting/transmitting member where an image is capable to be taken.

25 12. The component mounting apparatus as claimed in

claim 1, wherein the sensors of the inspection unit include sensors of different ranges of vision.

13. The component mounting apparatus as claimed in claim 1, wherein the sensors of the inspection unit include
5 sensors of different resolutions.

14. A component mounting apparatus in which electronic components (111) are held from an electronic component supplying device (110) and mounted on a circuit board (161), comprising:

10 a component holding head (120) configured to arrange component holding members (121) for holding the electronic components in a plurality of lines and in a plurality of rows and move in X and Y directions orthogonal to each other; and

15 a component height detecting device (140) configured to detect heights of the electronic components held by the component holding members in order to detect quality of hold postures of the electronic components held by the component holding members, the component height detecting
20 device having a pair of light emitting unit (141) and light receiving unit (142) configured to emit and receive light for detection (143) at a detectable angle (θ) with respect to an orthogonal direction (125) orthogonal to a moving direction (124) of the component holding members moved by
25 the component holding head, the detectable angle being an

angle for detecting individually each of the electronic components held by each of the component holding members.

15 15. The component mounting apparatus as claimed in claim 14, wherein assuming that an arranging interval between the component holding members in the moving direction is P1 and an arranging interval between the component holding members in the orthogonal direction is P2, the detectable angle is an angle obtained from

$$\tan^{-1}((P1/2)/P2).$$

10 16. The component mounting apparatus as claimed in claim 14, further comprising a control device (150) configured to determine the quality of the electronic component based on component height information in a detecting section (144) including a center of the component holding member in the moving direction among pieces of component height information sent from the component height detecting device.

15 17. A component mounting method for holding electronic components (111) and mounting them on a circuit board (161), comprising:

20 after holding the electronic components with component holding members (121) arranged in a plurality of lines and a plurality of rows, and before mounting the electronic components on the circuit board, projecting light for detection (143) at a detectable angle (θ) for detecting

individually each of the electronic components held by the component holding members with respect to an orthogonal direction (125) orthogonal to a moving direction (124) of the component holding members and receiving the light for detection, and inspecting quality of hold postures of the electronic components held by the component holding members.

18. The component mounting method as claimed in claim 16, wherein assuming that an arranging interval between the component holding members in the moving direction is P1 and an arranging interval between the component holding members in the orthogonal direction is P2, the detectable angle is an angle obtained from

$$\tan^{-1}((P1/2)/P2).$$

19. The component mounting method as claimed in claim 17, wherein determination of the quality of the hold postures of the electronic components is performed based on component height information in a detecting section including a center of each of the component holding members in the moving direction (144).